Notice of Allowability	Application No.	Applicant(s)	
	10/651,835	KRUMME, JOHN	
	Examiner	Art Unit	
	ALEX NOGUEROLA	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *preliminary amndt. of February 27, 2006*.

2. ☒ The allowed claim(s) is/are *30-44*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 6/27/2005
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other *IDS of 11/10/2003*.

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Craig Madson on December 27, 2006.

The application has been amended as follows: in line 17 of claim 1 "relate" has been replaced with -- relative --.

Allowable Subject Matter

2. Claims 30-44 are allowed.

3. The following is an examiner's statement of reasons for allowance:

a) Claim 30: the combination of limitations requires "... that an increase in fluid pressure in the outlet part of the valve fluid channel causes the tubular diaphragm to expand *transversely* relative to the valve fluid channel *towards the wall of the primary flow channel* to cause a reduction in the capacity for flow of the primary fluid in the primary flow channel when it is in the closed position compared with when it is in the open position. [emphasis added]"

In contrast, in Oborny et al. (US 6,224,728 B1) an increase in fluid pressure in the outlet part (180) of the valve fluid channel causes the tubular diaphragm to expand *longitudinally or axially* relative to the valve fluid channel port. See Figure 1 and note that diaphragm 170 will only move in the same direction as the axis of the valve fluid channel portion 180. Additionally, the tubular diaphragm does not expand towards the wall of the primary flow channel. The primary fluid channel fluidly connects with the tubular diaphragm through primary channel ingress and egress portions 190 and 195, respectively. As may be inferred from Figure 1 diaphragm 170 expands to close off the end of the ingress channel portion 190 and does not move towards the wall of the primary channel as shown, for example, in Applicant's Figures 1(a) and 1(b).

In contrast to the claimed invention, in the embodiment of Figure 11 of Hasselbrink, Jr. et al. (US 6,952,962 B2) there is no expandable diaphragm sleeve. Valves 1120, 1130, 1140, and 1150 use mobile monolithic polymer elements (120 in detailed valve Figure 1), such as polymer plugs, which move

parallel, not transversely to the primary flow channel (130). Additionally, the embodiment shown in Figure 11 is a pump not a valve. Although the pump comprises four valves the valves are arranged not to reduce the capacity for flow of the primary fluid in the primary flow channel, but to act as a "diode bridge" ensuring "... that there if [is] little is [if] any drop in fluid flow rate when current is switched." See col. 11:21-55.

b) Claims 31-35 depend directly or indirectly from allowable claim 30.

c) Claim 36: the combination of limitations requires the valve member to comprise "a compressible tube which forms part of the primary flow channel, the compressible tube being located within a chamber which is in fluid communication with the outlet part of the valve fluid channel so that an increase in fluid pressure in the said chamber as a result of flow of valve fluid into the outlet part of the valve fluid channel can cause compression of the compressible tube, to reduce the flow of the primary fluid through the compressible tube."

Neither Obornoy '728 nor Hasselbrink '962 discloses a compressible tube. In Obornoy '728 a diaphragm (170) reduces flow of the primary fluid by sealing the end of the primary fluid channel in ingress communication (190) with the valve. See Figure 1. In Hasselbrink '962 a mobile monolithic polymer element reduces flow of primary fluid by sealing a constriction in the primary fluid channel. See Figure 1.

d) Claim 37 depends from allowable claim 36.

e) Claim 38: the combination of limitations requires the valve member housing to have "a first opening at or towards the first end thereof which communicates with the inlet part of the valve fluid channel and a second opening at or towards the second end thereof which communicates with the outlet part of the valve fluid channel."

As seen in Figure 1 of Obornoy '728 only one end of the valve member (150) communicates with the valve fluid channel (150). The top end of the valve member is in fluid communication through an opening therein with one end part of the valve fluid channel (180), but the bottom end of the valve member is only in fluid communication with the primary fluid flow channel, through an ingress channel (190) and an egress channel (195).

As seen in Figure 11 of Hasselbrink '962 only one end of each valve (1120, 1130, 1140, 1150) is at or towards an inlet or outlet part of the valve fluid channel (unlabeled channel in which the membrane or a porous dielectric material (1110) is located). Additionally, the embodiment shown in Figure 11 is a pump not a valve. Although the pump comprises four valves the valves are arranged not to reduce the capacity for flow of the primary fluid in the primary

flow channel, but to act as a "diode bridge" ensuring "... that there if [is] little is [if] any drop in fluid flow rate when current is switched." See col. 11:21-55.

f) Claim 39: the combination of limitations requires "b) an inlet valve located downstream of the driver valve for controlling flow of primary fluid into the primary flow channel when it is acted on by the driver valve; and c) an outlet valve located downstream of the driver valve for controlling release of primary fluid from the primary flow channel when it is acted on by the driver valve; the pump further comprising a latching valve to control flow of the valve fluid in the valve fluid channel."

As seen in Figure 1 of Obornoy '728 only one valve is provided.

In the embodiment of Figure 11 of Hasselbrink '962 although there are four valves, which cooperate together, there is no driver valve, inlet valve, and outlet valve as claimed. The embodiment of Figure 11 of Hasselbrink '962 is for a pump wherein the valves are arranged not to reduce the capacity for flow of the primary fluid in the primary flow channel, but to act as a "diode bridge" ensuring "... that there if [is] little is [if] any drop in fluid flow rate when current is switched." See col. 11:21-55.

g) Claims 40-42 depend directly or indirectly from allowable claim 39.

h) Claim 43: the combination of limitations requires

> b) an inlet valve located upstream of the driver valve for controlling flow of primary flow into the primary flow channel when it is acted on by the driver valve; and
>
> c) an outlet valve located downstream of the driver valve for controlling release of primary fluid from the primary flow channel when it is acted on y the driver valve the valve member comprising a compressible tube which forms part of the primary flow channel, the compressible tube being located within a chamber which is in fluid communication within the outlet part of the valve fluid channel such that an increase in fluid pressure in the said chamber as a result of flow of valve fluid into the outlet part of the valve fluid channel can cause compression of the compressible tube to reduce the flow of the primary fluid through the compressible tube.

Neither Obornoy '728 nor Hasselbrink '962 discloses a compressible tube. In Obornoy '728 a diaphragm (170) reduces flow of the primary fluid by sealing the end of the primary fluid channel in ingress communication (190) with the valve. See Figure 1. In Hasselbrink '962 a mobile monolithic polymer element, such as a polymer plug, reduces flow of primary fluid by sealing a constriction in the primary fluid channel. See Figure 1.

Additionally, as seen in Figure 1 of Obornoy '728 only one valve is provided.

Also, in the embodiment of Figure 11 of Hasselbrink '962 although there are four valves, which cooperate together, there is no driver valve, inlet valve, and outlet valve as claimed. The embodiment of Figure 11 of Hasselbrink '962 is for a pump wherein the valves are arranged not to reduce the capacity for flow of the primary fluid in the primary flow channel, but to act as a "diode bridge" ensuring "... that there if [is] little is [if] any drop in fluid flow rate when current is switched." See col. 11:21-55.

i) Claim 44 depends from allowable claim 43.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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